# Energy Efficiency Potential:

Analysis Update

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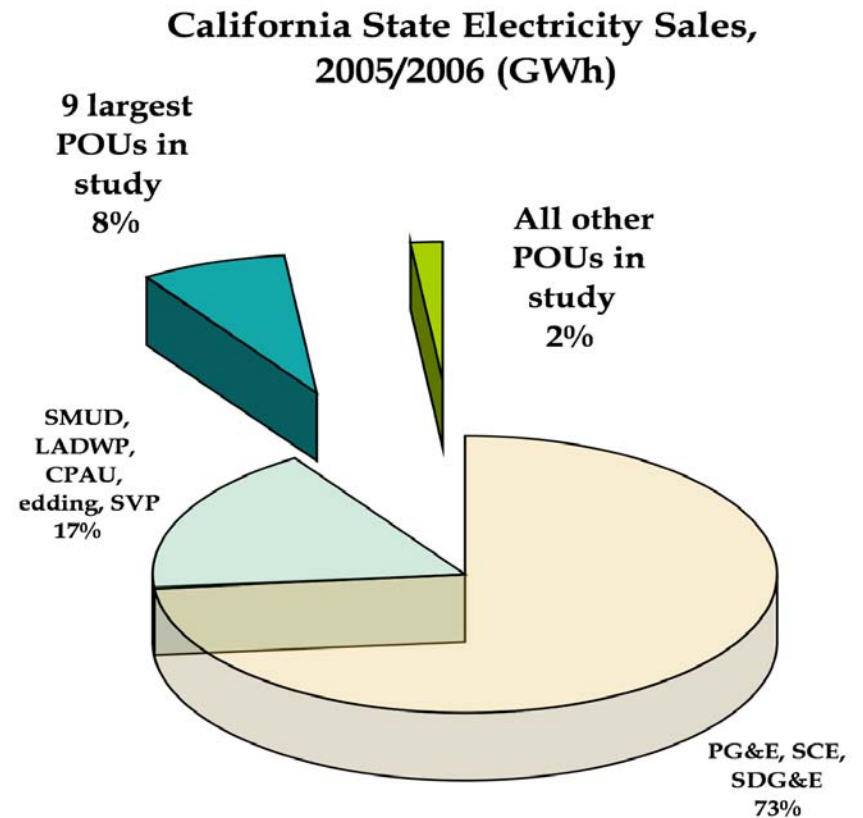Rocky Mountain Institute
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Scope of Project

- *Basis:* AB2021 requires POUs to estimate achievable, cost-effective efficiency potential over 10-year period

- *Goal:* Develop methodology for POUs to use, along with initial efficiency estimates

- POUs will work with governing boards to finalize efficiency estimates and provide results to CEC

- *This project:*

  - *Included utilities:* 35 POUs (9% of CA's electricity consumption)

  - RMI is working with SVP separately

  - *Excluded utilities:* SMUD, LADWP, CPAU, Redding, and IOUs

California State Electricity Sales, 2005/2006 (GWh)

All other POUs
9%

SMUD, LADWP,
CPAU, Redding,
SVP
17%

PG&E, SCE,
SDG&E
74%

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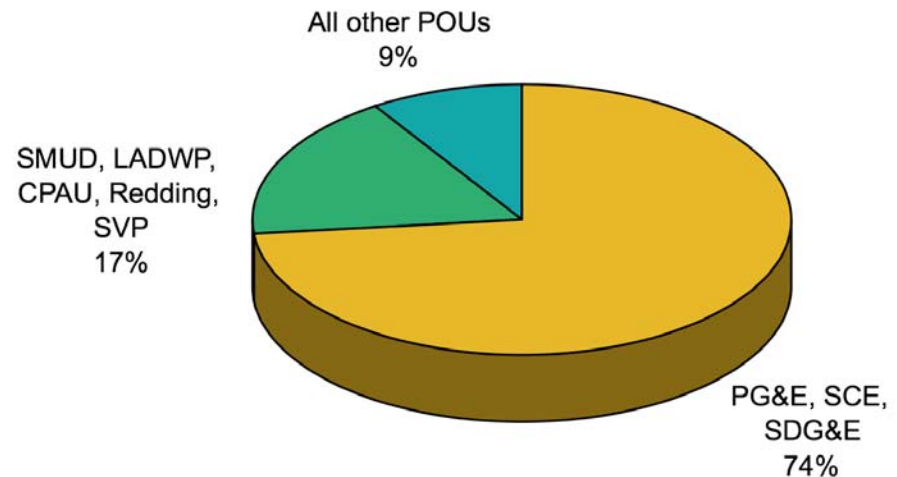
Detail on Study Group

9 largest POUs in study	All other POUs in study	
Imperial	Alameda	Healdsburg
Anaheim	Azusa	Hercules
Modesto	Biggs	Industry
Riverside	Banning	Island
Turlock	Colton	Lassen
Roseville	City of Corona	Lodi
Pasadena	Lompoc	Merced
Burbank	Needles	Moreno
Glendale	Rancho Cucamonga	Plumas-Sierra
	Shasta Lake	Port of Oakland
	Ukiah	Trinity
	Corona	Truckee Donner
	Gridley	Vernon

California State Electricity Sales, 2005/2006 (GWh)

9 largest POUs in study 8%

All other POUs in study 2%

SMUD, LADWP, CPAU, edding, SVP 17%

PG&E, SCE, SDG&E 73%

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Approach to Efficiency Modeling

- **Goal:**
  - Methodology to estimate cost-effective, achievable energy efficiency potential for 2007-2016 time frame, per AB2021
  - Provide "first round" targets for Governing Boards to consider

- **Basis:**
  - California Energy Efficiency Potential Study in 2006 (Itron)
    - Designed based on customer, system, and cost data from PG&E, SCE, and SDG&E
- **Customize for each NCPA/SCPPA utility based on:**
  - Climate zone
  - Building types
  - End uses
  - Rates/Avoided Costs

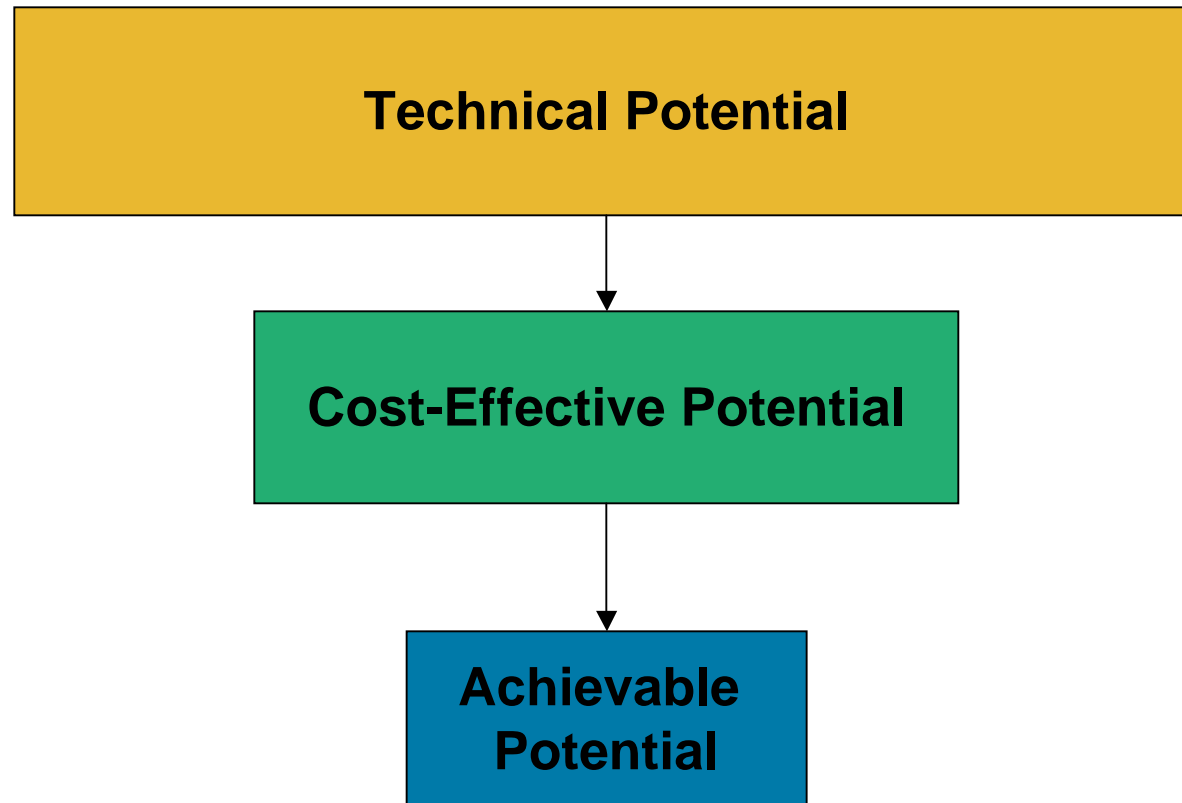Rocky Mountain Institute

Customization Data Requested

- Degree of customization for each POU depends on data provided
- RMI requested:

General	2006 consumption by sector (MWh)	Energy efficiency program cost
Climate Zone	Forecast system consumption (MWh, MW)	Retail electric rates ($/kWh) by sector
Discount rate	Building type breakdowns by sector	Avoided costs ($/MWh, $/kW-month) by TOU period
	End use breakdowns by sector	Program admin cost ($/kWh)

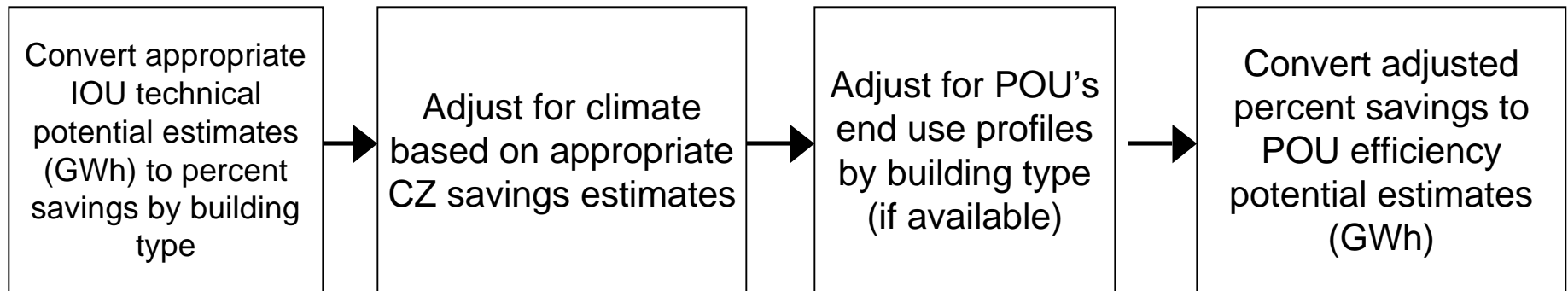- Where POU data was unavailable, use Itron data from most appropriate IOU or CZ.

Efficiency Framework

Technical Potential

↓

Cost-Effective Potential

↓

Achievable Potential

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Technical Potential
Customization for individual POUs

- Itron's IOU efficiency estimates are not directly applicable to POUs
- Estimates for IOUs customized for each POU based on:
  - climate
  - customer building type mix
  - electricity end uses
  - Load growth
- According to the following method:

Convert appropriate IOU technical potential estimates (GWh) to percent savings by building type	→	Adjust for climate based on appropriate CZ savings estimates	→	Adjust for POU's end use profiles by building type (if available)	→	Convert adjusted percent savings to POU efficiency potential estimates (GWh)

- Then forecast results over the 2007-2016 time frame, based on POU's consumption and peak demand forecasts.
  - Modify based on information about new construction vs. increased intensity

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Cost-Effective Potential
Customization for POUs

- Subset of technical potential

- Assumed to be all efficiency that passes the Total Resource Cost test

- Other cost tests (RIM, PCT, PAC) will also be calculated, using established E3 cost-effectiveness methodology

- Cost test calculations to be based on POU's retail electric rates, and avoided costs calculated by E3 for most appropriate IOU (unless POU-specific avoided costs are available)

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Achievable Potential
How to define achievable targets

- Key point: all adjustments are inherently qualitative & subjective

- Several strategies were initially considered
  - % of cost-effective potential
  - Max % of total load per year savings
  - Historical savings (as incremental % per year)
- Problem: insufficient data to make reasonable estimates, too coarse, not ambitious enough

- Final strategy: combination of these
  1. Baseline: historical savings, based on 1037 reported savings
  2. Utility estimates achievable annual penetration, by cost-effective measure, accounting for :
     - Load forecast *(EE easier to achieve in new construction)*
     - Customer mix *(large commercial EE easiest to achieve)*
     - Economies of scale *(larger utilities can achieve more)*
     - % of revenues spent on EE *(more $ = more savings)*
  3. Ability to ramp up this potential based on budget increases

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Output template for each POU

			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Technical Energy Efficiency Potential	Energy (MWh)	**System Total**										
		Residential										
		Commercial										
		Industrial										
	Demand (MW)	**System Total**										
		Residential										
		Commercial										
		Industrial										
Cost-Effective Energy Efficiency Potential	Energy (MWh)	**System Total**										
		Residential										
		Commercial										
		Industrial										
	Demand (MW)	**System Total**										
		Residential										
		Commercial										
		Industrial										
Achievable Energy Efficiency Potential	Energy (MWh)	**System Total**										
	Demand (MW)	**System Total**										

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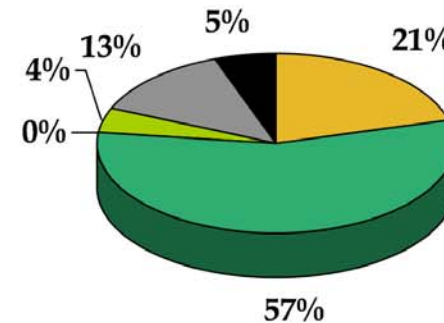
Sample outputs graphs

- To assist POUs with implementation, the following information will be included
- Accuracy depends on POU-specific data provided

Cost-Effective Potential (by sector)

31% 36% 33%
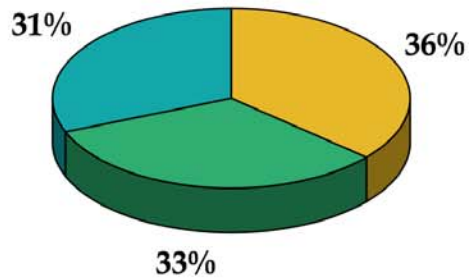
Residential Commercial Industrial

Cost-Effective Potential (Commercial Sector)

5% 13% 4% 21% 0% 57%

HVAC Lights Cooking Misc Refrig NC HVAC/DHW